

# Academy

California Academy of Sciences – Golden Gate

December 1998/January 1999



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To explore and explain the natural world

STEINHART AQUARIUM • MORRISON PLANETARIUM • NATURAL HISTORY MUSEUM

## Executive Director's Message

The decision to withdraw the Academy's bond measure—which we were to have put before voters this past November—was regrettable, but it gives us time to better understand the state of the Academy, not from a facilities point of view but from a programmatic one. Over the next 18 months we will

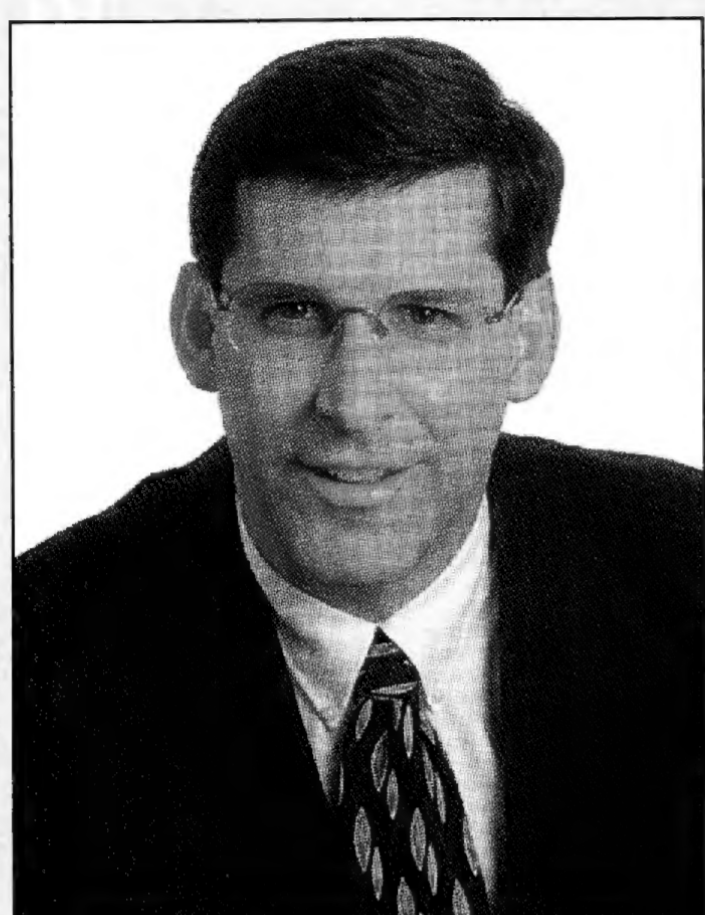


PHOTO: DONG LIN

Dr. Patrick Kociolek

engage focus groups, interview people from many different walks of life, conduct research and general fact-finding to understand the needs, limitations and potential of the Academy. We are interested in understanding better who our audience is, why people come to the Academy, what is

liked and where there is room for improvement.

You, our members, can provide us with an honest appraisal of what you think of the Academy, and we intend to ask you for your opinion of our programs and facilities. The expertise and advice of those outside our membership, even outside the world of museums, is important as well. We will talk to scientists, technologists, futurists, educators and both visitors and non-visitors to, ultimately, understand our role as a natural history museum, aquarium and planetarium in the twenty-first century.

We need to fully develop our programmatic goals for our core missions of research and education. "What areas of research will we pursue in the future?" "How can we make seamless our 'explore and explain' missions?" "How many more children can we educate with our current space limitations?" These questions are crucial to responsible planning. Addressing these and similar questions will help ensure that our facilities support well thought-out programs.

The end result of this process is a plan that will allow the Academy to thrive and flourish well into the twenty-first century. And having gone through this process we will be better positioned to inform San Franciscans about the future of the Academy, and to seek their support for a future bond measure. We look forward to involving you in this process. After all, our members are best equipped to provide the critical information and insights to assure the Academy is a vital part of the scientific and cultural life of the Bay Area.

## Loyalty and Longevity on Staff

Every workplace should have an employee like Doris Cantou. She is dedicated to her job, reliable, friendly, and well liked. And she is loyal: she has worked at the Academy of Sciences for 30 years. But what makes Doris so unique is that she just celebrated her 90<sup>th</sup> birthday.

A native San Franciscan who still lives in the house in which she was raised, Doris graduated from U.C. Berkeley with a teaching credential. After 10 years at San Francisco's Mechanics' Institute Library, and with the onset of World War II, Doris became a full time mother and wife. Several years later she would become involved with the California Botanical Club, and subsequently introduced to the Academy.

Doris worked first in the Academy's botany library, followed by the botany department and finally in the library where she has worked since September 1967. She is in charge of the serials Kardex where she oversees all periodicals that come to the library. It is her responsibility to check each issue as it arrives, note its volume number and the date it was received. It is the only task in the library that is still performed manually and that suits Doris just fine.

Over the years the Academy has experienced many

*Cont'd. on page 10*



PHOTO: DONG LIN

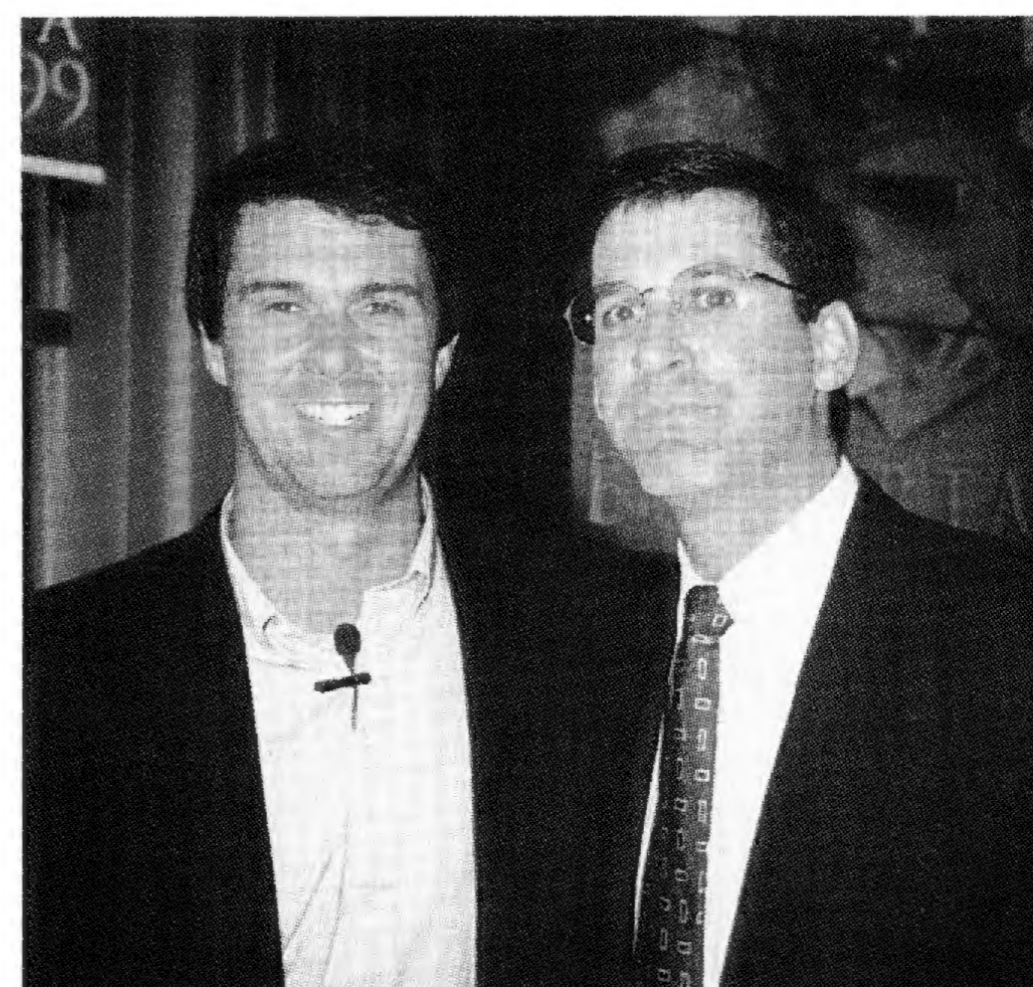
Academy Librarian Doris Cantou

## Microsoft at the Academy!

September's Free Day turned out to be quite a day at the Academy of Sciences. Microsoft Corporation's President Steve Ballmer unveiled the latest addition to its Encarta® family of reference tools, Encarta Reference Suite 99, at a press conference in the Morrison Auditorium.

Spectators and local school children filled the auditorium

and watched Ballmer and Robbie Bach, Vice President of the Learning & Entertainment Division at Microsoft, demonstrate how the new Encarta Reference Suite 99 works and some of its features.

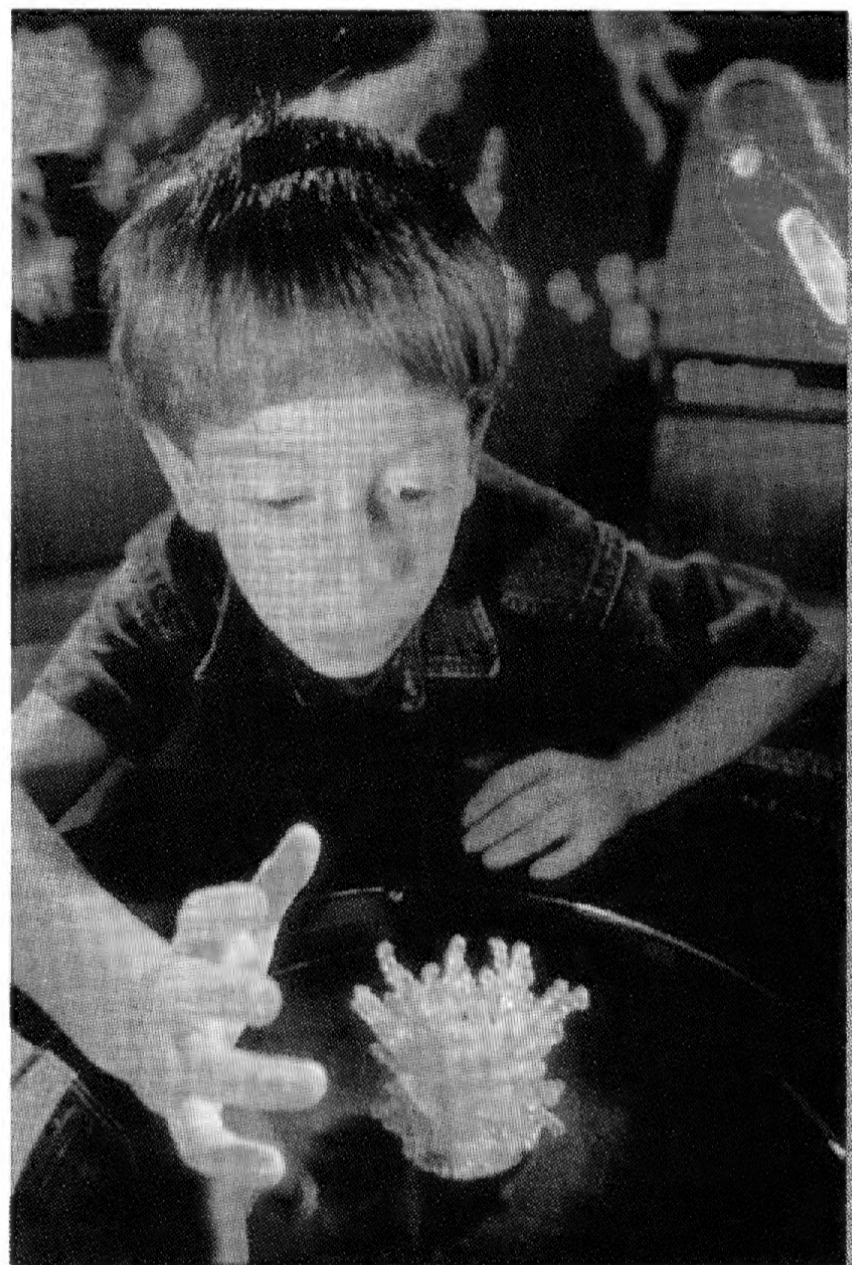


Executive Director Patrick Kociolek with Robbie Bach of Microsoft.

## Microbes Invade Academy

Thanks to our current temporary exhibition, the Academy has been overrun with bacteria, fungi, viruses and protozoa since October. **Microbes: Invisible Invaders...Amazing Allies** is an exhibit that magnifies and animates the world of what are commonly known as "germs." Sponsored by Pfizer, this exhibit integrates many forms of media—including 3-dimensional animation, a simulated electron microscope, video games, holograms, artifacts and plaster figurines—to animate this level of life that is so often forgotten and misunderstood.

Two special previews accompanied the arrival of these amazing creatures: on Thursday, October 1 and Friday, October 2 over one thousand Academy members, media and special guests enjoyed a sneak peek of the exhibit and participated in special microbial activities. Since then, the exhibit has been teeming with visitors and face-to-face microbial encounters. If you haven't already met the Microbes at the Academy, make sure to do so before they *disappear* on January 10, 1999!

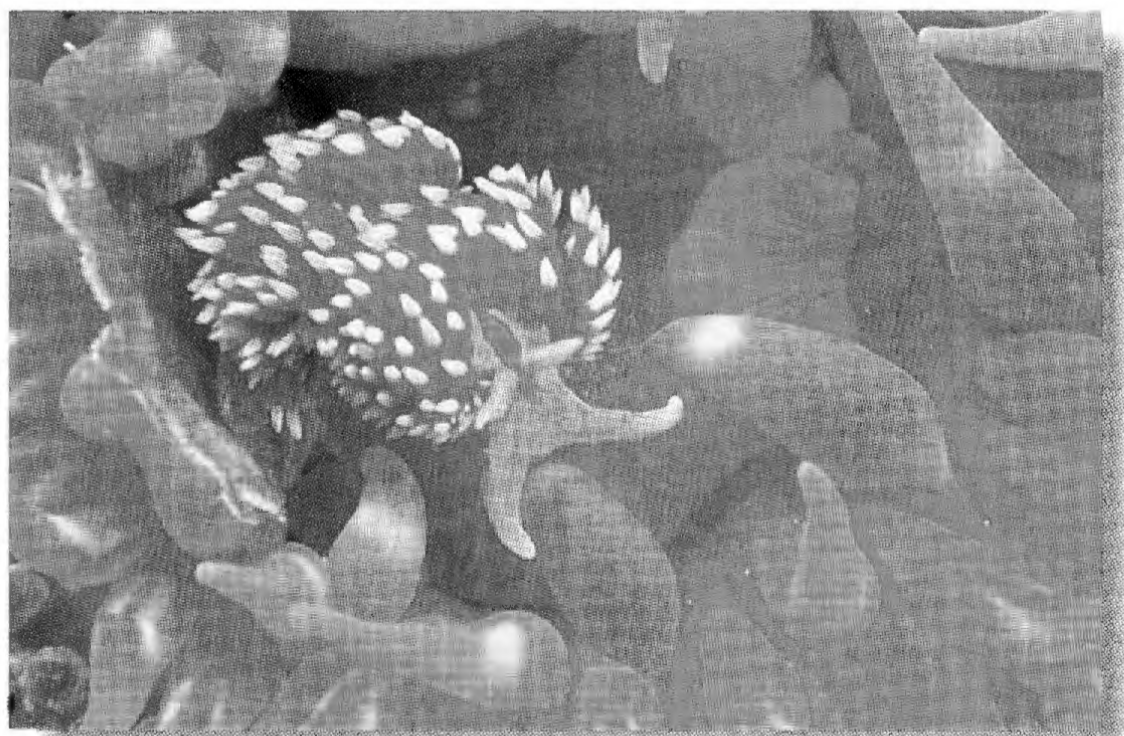


A young visitor swipes his hands through the floating 3-D image of a penicillin fungus.

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## Pacific Currents

September 5 - Feb. 28, 1999  
Oceans/Linking Hall



*Hermisenda crassicornis* crawls across an anemone.

marine biodiversity along North America's West Coast. The thirty photographs of fishes, whales, and many other life forms are visual testaments to the wealth and wonder of life found in the Pacific waters from Mexico to the northernmost shores of Canada. Three regions come to life through these images: the Sea of Cortez, and the offshore water of California and British Columbia. By recognizing the continuity of Pacific sea life that extends beyond national borders, this exhibit educates visitors on the vastness and color of this very precious shared resource.

This collection of photographs, brought together by the multinational Commission for Environmental Cooperation (CEC), celebrates the richness of

## Coming Soon:

### Masters of the Night: The True Story of Bats

February 13, 1999 - May 2, 1999

*Bats will fly into your hair.*  
*Bats always want to suck your blood.*  
*All bats carry rabies.*  
*He's blind as a bat.*

The mystery of the bat, an elusive nocturnal creature common to most habitats, has inspired great stories and folklore. Perhaps no other mammal has captured the human imagination with such mythical proportions as the bat. The haunting images of shadowy creatures with ulterior motives still can cause a shudder among children and adults alike. But beyond Dracula and vampires, do you *really* know how bats live?

Beginning February 13, you will have the opportunity to explore a different world of bats, which is in many ways more fantastic than any tales we could ever imagine. Bats have an incredible array of sensory and flight adaptations that enable them to live on almost every continent on the planet. **Masters of the Night: The True Story About Bats** explores the diversity of the more than 1,000 species of these winged wonders.

Discover just how "blind" most bats aren't, why they hang upside down, and how they navigate through the blackest caves. Hear sounds as a bat does, and find out where they

live. Imitate how a bat flies and determine how related they are to humans. These creatures will *still* capture your imagination - and maybe your heart!



### Special Guests to Visit Masters of the Night

February 13, March 20, April 10 & April 24, 1999  
1:30 PM

Don't miss the rare opportunity to observe non-releasable bats up close and in person. Several species of local bats will be presented and discussed. Patricia Winters from the California Bat Conservation Society will share her knowledge gained from thirty years experience as a wildlife rehabilitator and educator. Her chiropteran companions are native to this area and are powerful educators about the facts and myths surrounding this amazing mammal. There is no additional charge for these presentations.

Look for these very special guests on the above Saturdays at 1:30 PM, in the Auditorium. For more information, call (415) 750-7318.

## 14<sup>th</sup> Annual BioForum

Not even the first significant fall rain storm could dampen the enthusiasm of the more than 120 participants in this school year's first BioForum for high school science teachers. In conjunction with the opening of the temporary exhibit ***Microbes: Invisible Invaders...Amazing Allies***, the topic of the October 24, 1998 BioForum was Microbes. The BioForum series provides teachers with information on current scientific research and with the opportunity to interact with scientists. The entire presentation, including visual materials used by the speakers, will be posted on the World Wide Web to insure maximum dissemination of the information (see p. 5).

As moderator, Dr. J. Patrick Kociolek, Executive Director of the California Academy of Sciences, noted that microbes are extremely diverse, complex and ubiquitous. The panel of three research scientists then proceeded to fill in the details by providing background information and describing their ongoing research activities. Dr. Lynn J. Rothschild, Research Scientist at NASA Ames Research Center, discussed protists, ultraviolet (UV) radiation and evolution. Readily admitting her fondness and bias toward microbes, Dr. Rothschild presented evidence to support her hypothesis that UV radiation has been a driving force in molecular evolution since it is both a mutagen and a selective agent.

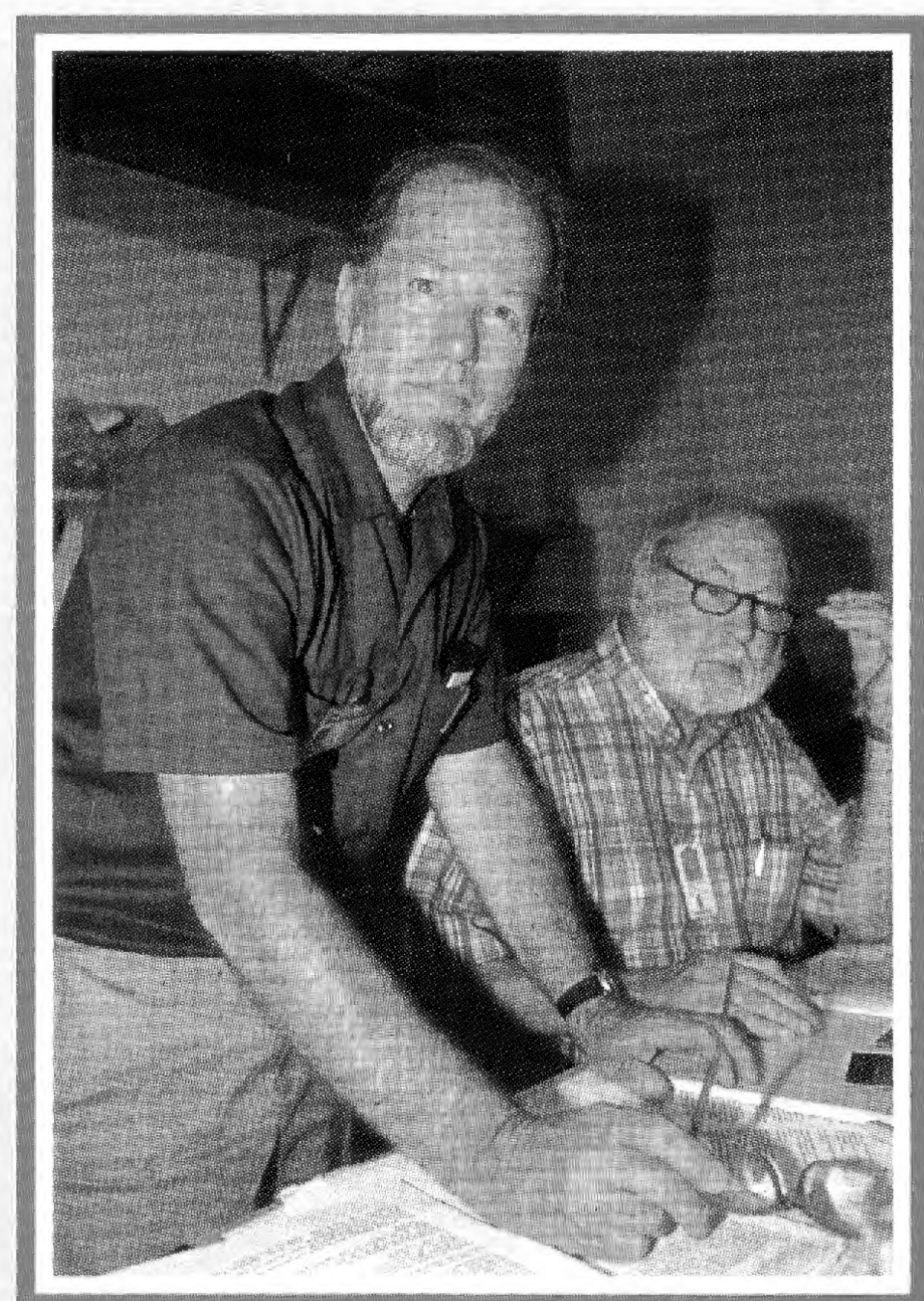
Cryptogams were the focus of the talk by Dr. Jeffrey J. Johansen, Assistant Professor of Biology at John Carroll University. Cryptogams are biological soil crusts composed of cyanobacteria (blue-green algae), eukaryotic algae, fungi, lichens and mosses. These microbiotic crusts occur in arid lands worldwide and are a crucial component of desert

ecosystems. They provide soil stabilization by preventing wind and water erosion and contribute to soil fertility through nitrogen fixation and retention of fine soil particles. Dr. Johansen has examined not only the roles played by the crusts, but also the impact of disturbance from trampling by livestock or vehicles, and techniques for restoration of microbiotic crusts in disturbed areas.

Mirroring the diversity of microbes themselves, the third panelist addressed a completely different aspect of microbe biology. Dr. Arthur E. Girard, Principal Research Director, Infectious Disease Group of the Pfizer Central Research Group, explained how antimicrobial, especially antibacterial, agents work and how microbes develop resistance to drugs. After a quick survey of the diversity and adaptability of microbes, Dr. Girard pointed out that many microbes are beneficial and an absolute requirement for life as we know it; less than five percent of them are pathogenic. Although relatively few in number, pathogens obviously have a tremendous impact on humans and have been the subject of extensive research. We now know details on the various mechanisms of antibacterial actions and why there is an increasing incidence of drug resistance in microbes.

The BioForum concluded with a free-wheeling question and answer period between the teachers, the panelists and Dr. Kociolek. Everyone left with a greater appreciation for the microscopic life that abounds around, on and within us. The teachers are now armed with new information and ideas for the classroom, and have had the opportunity to interact with scientists on the cutting edge of microbial research.

### Outstanding Volunteer



Carl Elliger, left and Dr. Robin Lawson

Carl Elliger spent 25 years as a plant chemist with the U.S. Department of Agriculture, studying ways to deter insects without the use of pesticides. After opting for the early retirement package when it was presented, he offered his services to the Academy's research division, hoping that his background in organic chemistry and lab work could be useful in some way. To say he has succeeded would be a serious understatement!

The Osher Laboratory for Molecular Systematics, a resource for scientific research in all biological disciplines represented at the Academy, was a perfect fit given Carl's background. Carl divides his time between Childrens' Hospital of the East Bay and the Osher Lab, where he assists Dr. Robin Lawson, Senior Research Fellow and Department Head, by extracting and sequencing DNA molecules. Carl has worked primarily on snakes and some fish for Dr. Lawson, elapid snakes (cobras, sea snakes, etc.) for Dr. Joe Slowinski, Asst. Curator of Herpetology, and has also assisted Dr. Peter Fritsch, Asst. Curator of Botany, in his study of a group of primarily Asian plants. If you would like to find an area of the Academy that is a perfect fit for your skills, call (415) 750-7154 for an application.

## BioForum Series for High School Teachers

The 1998-1999 BioForum is funded in part by: The Pfizer Foundation, Inc., Genentech, Inc.; ALZA Corporation in honor of Rudy A. Peterson; and Mrs. John S. Hensill. The BioForum website is a partnership between Access Excellence, a program sponsored by Genentech, and the California Academy of Sciences.

The California Academy of Sciences' BioForum, now in its fourteenth year, provides professional development to science teachers around the country. Each BioForum is a day-long seminar of three scientists presenting their research. The presentations, which address aspects of a particular theme, are followed by a panel discussion.

An innovative partnership between the Academy and Genentech's Access Excellence, BioForum continues to be available on the Internet, providing enriching professional development to science teachers around the country. The presentations can be accessed at the Academy's website at <http://www.calacademy.org> and Genentech, Inc's. Access Excellence website at <http://www.gene.com/ae/BF>

### Conservation Biology

February 6, 1999

Moderator: Tom Moritz  
Librarian, California Academy of Sciences

### Modern Systematics

April 17, 1999

Moderator: Terry Gosliner, Ph.D.  
Director of Research, California Academy of Sciences

8:30 am to 3:30 pm, Morrison Auditorium

**Registration:** \$15. for each BioForum (morning refreshments and lunch are included)

#### Registration/Refund Deadlines:

January 29, 1999 — Conservation Biology

April 9, 1999 — Modern Systematics

**San Francisco State University continuing education units will be available. Most school districts accept this program for increment credits.**

**To register, please call the Education Department at (415) 750-7100 or E-mail [klundstrom@calacademy.org](mailto:klundstrom@calacademy.org) The registration form can be down-loaded from the Academy's world wide web site at <http://www.calacademy.org> under Education.**

## New and Renewing Donor Circle Members

July and August 1998: \$125 to \$999

Donor Circle membership contributions support the Academy and significantly advance our work in research and education. It is with great pleasure that we gratefully acknowledge these gifts.

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		Mr. James Wintersteen
		Mr. Philip Yee

## December

## Members Holiday Evening

We'd like to begin this holiday season by thanking you, as a valued member, with an evening of spectacular values, extra savings, entertainment, and refreshments.

Headlining the evening's entertainment will be the *Barbary Coast Cloggers*, performing in the auditorium at 7:30 pm.

The *Barbary Coast Cloggers* were formed in 1981 to educate the public about an indigenous folk dancing style of North America. (Developed hundreds of years ago as a dance of immigrants in the Eastern United States, clogging has remarkably diverse origins—borrowing from Native American, African, and European dance traditions.)

The Academy Gift Store will be open all evening for members to enjoy a double discount on all purchases, plus free gift wrapping. For this one evening only, *Santa Fe Crafts*



Barbary Coast Cloggers

will be hosting a sale of Hopi, Navajo, and Zuni jewelry, bowls, and baskets. In addition, our own Academy staff will present their exquisite handmade jewelry, candles, cards, and ornaments

to enrich your shopping experience in African Hall.

In this count-your-blessings time, all of us at the Academy Membership office join in wishing you a warm, happy, and healthy holiday season.

December 9, 6 to 9 pm (no 2 pm meeting)

## January

## Madagascar Odyssey

with Drs. David Kavanaugh and Charles Griswold of CAS Entomology and Keith Howell, editor of *California Wild*.

In April of 1998, an Academy team consisting of five entomologists, the editor of *California Wild*, and our staff photographer returned from a major expedition to Madagascar. They were awe-struck by the incredible diversity of plant and animal life, including thousands of species found nowhere else in the world.

In 28 days on the island, the scientists gathered over 10,000 specimens of various types of insects and arachnids. Dr. Griswold estimates that 300 species of spiders alone are represented in this sample.

The realized objectives of the expedition were threefold.

First, the researchers were able to focus on their particular areas of study in one of the richest areas of biodiversity in the world, while

gathering specimens to

build the Academy collection. Second, they were able to raise awareness and help contribute to the environmental efforts of the country through demonstrations and lectures to students and Peace Corps volunteers. Third, they consulted with officials and rangers from Ranamafana National Park, providing comments on the state of the reserve and making suggestions for improvement.

Come meet the team, watch the video and slides, and hear their amazing (and sometimes funny) stories from the Academy's expedition to the rain forests of Madagascar.

January 13, 2 & 7:30 pm

## Upcoming Members Meetings

February 10, 1999

Beyond Reason: Pseudo-Science in America  
with Dr. Jere H. Lipps, Professor of Integrative Biology,  
UC Berkeley

March 10, 1999

The Search for the Giant Squid  
with Richard Ellis, marine artist and author.

## The Joy of Giving

Here's a way to feel good about yourself in one satisfying gulp during the holiday season, or any time of the year.

Purchase a Group Membership for a nonprofit group in your area so they can come together at the Academy in an atmosphere of learning, discovery, and fun.

We now have ten group memberships supported by Academy members, including half-way houses, senior centers, and youth organizations.

This unique partnership is available to social agencies, day care and senior centers, and nonprofit youth groups. A Group Membership provides an exciting opportunity for an organization to take advantage of the wonderful resources of the California Academy of Sciences.

To qualify, an organization must be a nonprofit and serve children, seniors, or individuals with disabilities. Schools are not eligible.

The cost of a Group Membership is \$250 per year. To apply, please send your check and the name of the organization to the Membership Office at CAS, or call (415) 750-7111.



The Madagascar Expedition Team

PHOTO: DONG LIN

## Which Way is the Stock Market Headed?

We don't know any more than the experts in the financial world, but we would like to make a suggestion... As 1998 ends, consider *giving out* of the market rather than *selling out*. You may ask yourself, "Why should I want to give money away—no matter how philanthropic I am—when I am concerned about my financial future?" If you believe that the market is at a peak or has an increasing likelihood of continued volatility or major downturn, read on.

Whether you think investment markets are going up, down, or sideways, there are planning strategies that can help you meet your personal financial goals with gifts of appreciated securities. With the right planning you can make a gift, obtain the benefits of important tax deductions, avoid capital gains tax and even receive income.

Making a gift to the Academy is always a satisfying investment. You can help make extraordinary research and education in natural science available for our community now and you can provide for future generations. You can combine your personal planning with your wish to help the Academy. Please use the order form on page 14 or call (415) 750-7216 to ask for gift planning information.

Many thanks to the following members who have increased their support of the Academy and its Annual Fund in the last six months:

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Curtis & Karen Sanford  
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Mr. Austin Shaffer  
Ms. Patricia Skala  
Mr. & Mrs. Dean Watkins

## Recent Corporation and Foundation Support

The Academy is pleased to announce the renewal of funding for two major programs. The Bernard Osher Foundation has graciously awarded the Academy a grant to support the Free Day program. This program (free admission the first Wednesday of each month) has become one of the most effective ways to reach our local communities. During the 12 Free Days of the last fiscal year, 117,640 people visited the Academy courtesy of the Bernard Osher Foundation.

The Oracle Corporation of Redwood City has also renewed its commitment to the Academy's Madagascar research initiative. By supporting the current, strategic scientific research in Madagascar, and our related educational and public programs, the Oracle Corporation enables the Academy to help people build a critical understanding of the natural world and strengthen the sense of caring for the planet we share. The Academy is grateful for Oracle Corporation's continuing support.



Free Day at the Academy.

## The Academy Invites Your Support of Our New Challenge Grant

The Academy is excited to receive a \$120,000 Challenge Grant, which will match dollar for dollar the increased portion of renewed contributions **and** any new unrestricted gifts received before July 1, 1999.

The grant provides a critical resource of unrestricted support for the Annual Fund. The Fund assures our scientists' research worldwide, and enables the Academy to present a diverse program of outstanding exhibits, classes, and lectures each year.

Please consider this important opportunity to increase the impact of your support. The additional \$240,000 raised by the grant will help us make new strides in the areas of education, the natural history museum, the planetarium, the aquarium, and research.

## Benjamin Dean Lectures

### Defining the Early Universe

Dr. Marc Davis

The theme of the Fall 1998 Benjamin Dean Lecture Series is the very early universe. On December 15, Dr. Marc Davis, from UC Berkeley, will look at implications of the large scale structure of the local universe.

Cosmologists are concerned with the big picture. Just what is the structure of our universe on the very largest scale? Our current view is of a universe quite smooth and homogeneous when taken as a whole. But when measured on scales smaller than 30 million light years, it appears very lumpy and nonuniform. Galaxies are observed to be strongly clustered into large groupings and filamentary structures surrounding regions seemingly devoid of virtually of all matter. But now



Dr. Marc Davis

accepted theories suggest that the universe was extremely smooth during the earliest phases of the Hot Big Bang. So how did the currently observed clustering evolve? What role will the ubiquitous dark matter play in the ongoing evolution of the universe? Can current observations reveal to us the ultimate fate of the universe?

Dr. Marc Davis is recognized as a leading authority on physical cosmology. He will share with our audience

members the results of his redshift survey of galaxies, and interpret his numerical simulations of the development of the overall structure of the universe.

Tuesday, December 15 at 7:30 pm, \$3.00

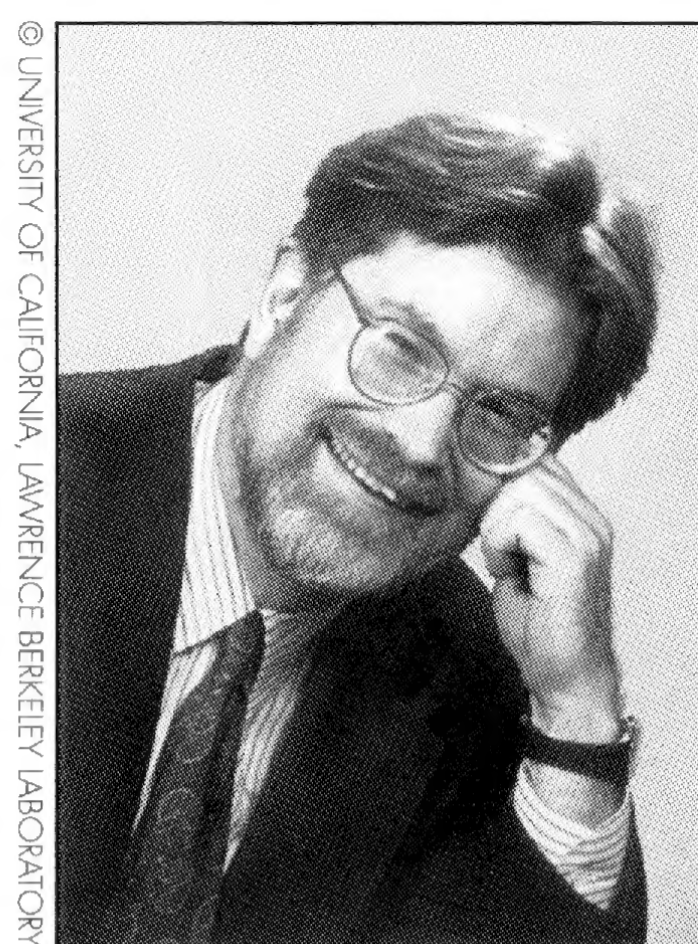
### Observing the Early Universe

Dr. George Smoot

Dr. George Smoot will address the profound mystery of the origin and development of the observable universe. Smoot considers the facts from observations: stars shine against a dark background. The universe is expanding. The luminous matter in the universe is hydrogen plus a dash of helium and minute traces of everything else. This luminous matter is distributed in great clusters and sheets separated by huge voids. More than 90% of the matter is dark and probably unknown. The universe rings with isotropic, blackbody radiation, the all-pervasive echoes of the primeval fireball of the Big Bang. We currently find ourselves in the midst of the awesome venture of searching for conclusive answers on the evolution of the universe.

Through speculative ideas, the extrapolation of known laws of physics, and careful observations we are now able to probe time and space and have arrived at a standard model

of the beginning and evolution of the universe. Smoot, of Lawrence Berkeley Laboratory, University of California



Dr. George Smoot

Berkeley, will lead our series on the early universe by reviewing how we have developed our present understanding. Particular emphasis will be given to the data from the COBE (Cosmic Background Explorer) satellite. Observations include the relic radiation of the ripples in space-time, that is, the cosmic background radiation is smooth, but not perfectly so. Dr. Smoot will address the question of whether these minuscule variations are enough to

describe the origin and development of the universe.

Following his talk in the planetarium, Dr. Smoot will autograph copies of his book *Wrinkles in Time*. For more information, please call (415) 750-7141.

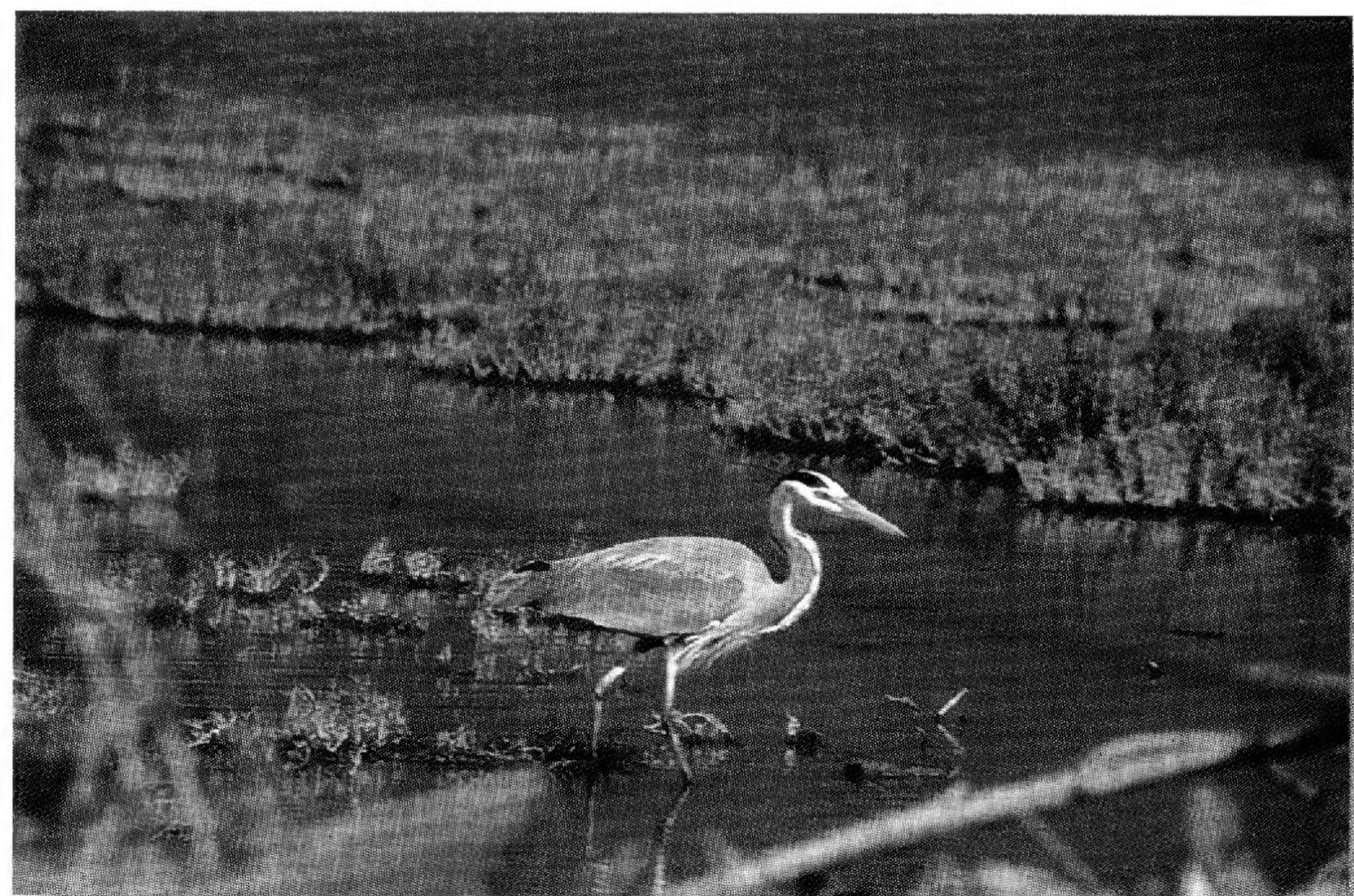
Tuesday, January 19 at 7:30 pm

## Adult Education

### Saving the Marin-Sonoma Coast

L. Martin Griffin

Within minutes of crossing the Golden Gate Bridge from San Francisco into Marin County, visitors enter a natural paradise filled with rare plants and animals. Drawing primarily from personal experience, Dr. Marty Griffin tells the dramatic story of preserving the wild Marin headlands. His new book, *Saving the Marin-Sonoma Coast*, documents the creation of the magnificent Audubon Canyon Ranch wildlife preserve on Bolinas Lagoon and Tomales Bay and their role in rescuing the Point Reyes National Seashore. Griffin also recounts the struggle to protect California's coastal watersheds and to keep



Great Blue Heron, *Ardea herodias*

the Russian and Eel Rivers wild. This entertaining and inspiring historical overview of some of the Bay Area's most beloved wildlands will appeal to anyone who uses and appreciates the parks and preserves of Marin and Sonoma counties.

December 3 (Thursday), 7:00 - 8:30 pm  
\$6 members/\$10 non-members  
Booksigning immediately following lecture.

## A Gaggle of Geese, A Wedge of Swans

Luis Baptista and Doug Bell  
Field Trip

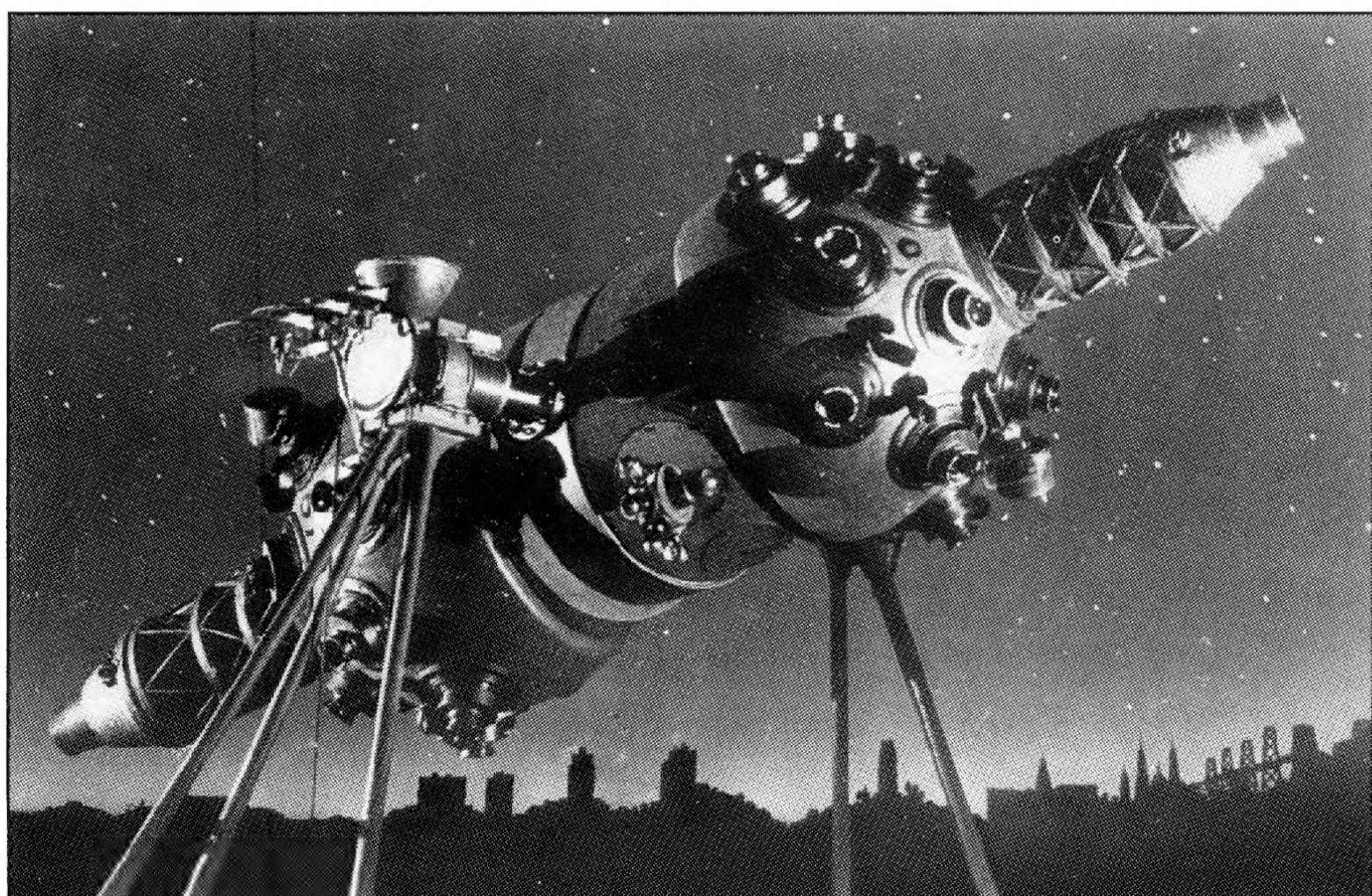


PHOTO: LLOYD INGLES

A flight of geese.

The Sacramento Valley is one of the most important wintering areas for the waterfowl of the Pacific Flyway. The Sacramento National Wildlife Refuge is one of four refuges that grow rice, millet and other grains to keep birds away from neighboring crops. As a result, it is an excellent place to view some of the hundreds of thousands of waterfowl and marsh birds as they rest and feed.

December 12 (Saturday), 7:30 am - 5:30 pm  
\$55 members/\$65 non-members  
Includes transportation and cold drinks.



Morrison Planetarium's star machine

## Skies of Winter

Daryl Stanford

Join Daryl Stanford for another popular seasonal star-watching class to unravel the mysteries of the winter constellations. Learn how to locate the North Star, find the Flying Horse, and distinguish a planet from a star. Enjoy the mythology of the skies all in the comfort of the Morrison Planetarium.

January 8 and 15 (Two Fridays), 7:00 - 9:00 pm  
\$25 members/\$30 non-members

## Magnitude 8: Earthquakes and Life along the San Andreas Fault

Phillip Fradkin

To understand the cataclysmic earthquake that may tear California apart one day, Phillip Fradkin recounts the dramatic history of earthquakes and guides us along the San Andreas Fault, the world's best known tectonic landscape. Reading from his new book, *Magnitude 8: Earthquakes and Life Along the San Andreas Fault*, Fradkin describes vivid scenes from earthquakes across North America, Europe and the Far East, placing us at the epicenter of the most instantaneous and unpredictable of all the Earth's phenomena. A noted environmental historian, Fradkin details the human dimensions of earthquakes, paying particular attention to Bay Area events.

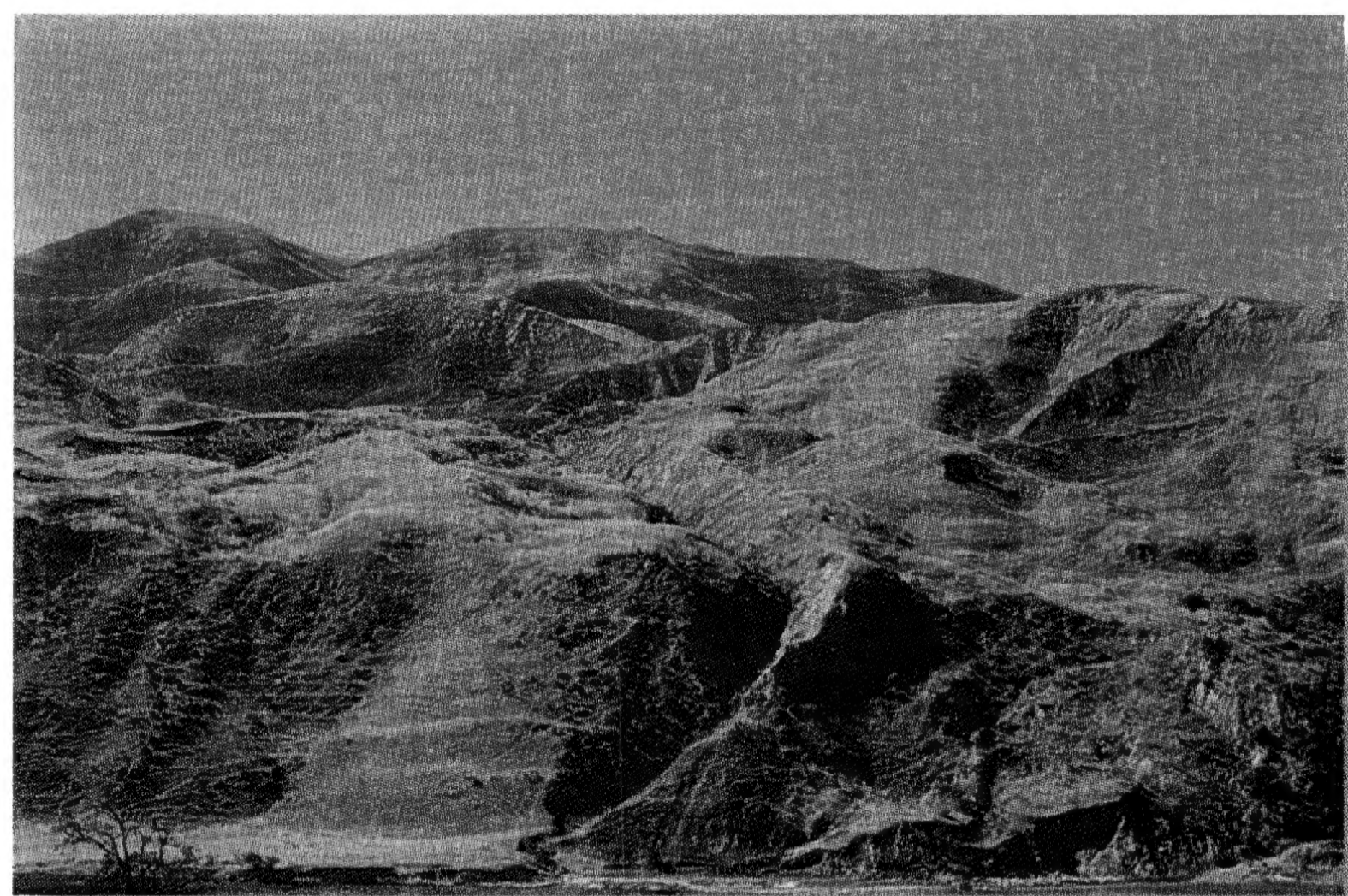


PHOTO: C. WEBBER

San Andreas Fault, coast range hills

January 14 (Thursday), 7:00 - 8:30 pm  
\$6 members/\$10 non-members  
Book signing immediately following lecture.

## Language and Human Evolution

Matt Cartmill

*Presented by The L.S.B. Leakey Foundation and  
California Academy of Sciences*

The ability to speak is uniquely human. Although some other animals (including apes, dolphins and parrots) show surprising capacities for picking up bits and pieces of our symbol systems, they have no language system of their own. In this lecture, Cartmill looks at the anatomical underpinnings of

language, weighs the evidence for language origins that scientists have tried to gather from bones and artifacts, and reviews recent models of prehistoric language derived from studies of living apes and humans. He shares new, unpublished data on the evolution of the nerves to the muscles in the tongue and reevaluates current theories about human evolution in light of these findings.

February 18 (Thursday), 7:00 pm

This lecture is preceded by a cocktail reception from 6:00 - 7:00 pm

Lecture only: \$6 members/\$10 non-members

Lecture and reception: \$36 members/\$45 non-members

## Evolution of Flowering Plants

Glenn Keator

Lecture and Field Trips

Many people believe that the evolution of flowering plants revolutionized the entire natural world, maintaining that mammals would not have come into dominance had it not been for the energy-rich fruits offered by the flowering plants. However, exactly how and when flowering plants first appeared continues to remain a mystery. Through lectures and field trips, delve into the remarkable world of flowers. Examine their remote beginnings and their evolution into the myriad of plant families we see today.

January 20 - February 24 (Six Wednesdays), 7:00 - 9:00 pm

Field trips: January 30 and February 13 (Saturdays)

\$115 members/\$125 non-members

Field trip times will be discussed in class.



PHOTO: BUFF AND GERALD CORSI

California poppies, owl's clover and goldfields in Antelope Valley, CA

### Doris, cont'd. from page 2

changes. Doris observes that the library's evolution has been important, "The library used to be for members only. But what we have now is an extraordinary place for education, where we can offer everything from children's books to the biodiversity center. We have widened our goals and in the process, made this wonderful place available to the public."

Doris continues to set a new standard for dedication and positive attitude on the job. And those around her at the Academy are grateful for the inspiration she provides.

## The Wildlife Talks

*A series of three lectures sponsored by the  
Wildlife Conservation Society and  
California Academy of Sciences*

### Stalking the Greater Yellowstone Ecosystem: Rubbing the Lynx the Right Way

with John Weaver

Understanding the role that the Lynx, *Lynx canadensis*, plays in the forest ecosystem has been nearly impossible, until now. A nocturnal, solitary lifestyle and rapidly declining numbers make it nearly impossible to spot the Lynx with conventional assessment methods. In this lecture, John Weaver reveals a new, non-intrusive yet effective technique he developed to survey Lynx populations. Based on the cat's natural inclination to rub against sharp objects, Weaver uses a grid of catnip-scented rubbing posts to snag hair from the Lynx or any other cat that may be in the area. DNA analysis is then used to identify the species and individual. Determining the presence or absence of these top predators helps in understanding the overall health of the forest ecosystem and provides guidance in the development of future recovery plans.

All programs begin at 7:30 pm in the Morrison Auditorium. A cocktail reception for the scientist precedes each program from 6:30 - 7:30 pm.

### Upcoming Wildlife Talks:

#### Basic Faunal Inventories: Prerequisites for Conservation in Madagascar

with Dave Kavanaugh  
April 22, 1999

#### Saving Wild Animals: Veterinary Medicine in the Field

with William Karesh  
June 10, 1999

### Wildlife Talks Pricing

#### Lectures Only:

Members: \$6 per lecture/\$12 for series of three

Non-Members: \$10 per lecture/\$20 for series of three

#### Lectures and Receptions

Members: \$36 per lecture/reception/\$75 for series of three

Non-Members: \$45 per lecture/reception/\$110 for series of three

## Traditional Arts of the World

All regular programs take place at 1:00 pm on select Saturdays, in the Morrison auditorium and last about one hour. Presentations are free after general admission to the museum. For further information on any of these events, please contact Almudena Ortiz at (415) 750-7165. The Traditional Arts Program is funded by the Paul L. and Phyllis Wattis Foundation.

### December

December 5 — Jewish Klezmer Music  
in Honor of Hanukkah



Ellis Island, Old World Folk Band

Klezmer is a jazz-like form of Jewish dance music that originated in Eastern European ghettos. Klezmer music became Americanized as immigrants passed through the gates of Ellis Island. The Ellis Island Old World Folk Band,

formed in 1980 in Berkeley, is proud to be a part of the Klezmer music tradition and will perform in honor of Hanukkah.

December 12 — Holiday Concert (1:30 pm)

Members of the Deutscher Musik Verein brass band return to the Academy for their annual concert of Christmas music from around the world. Get in the holiday spirit and join us in celebrating the joyous sounds of the season (**African Hall**).

### January

January 9 — Bulgarian Music

Bulgarian folk music is, structurally speaking, extremely complex since it frequently features uneven meters such as 5/8, 7/8, 9/8 and 11/16. Over the course of this century Bulgarian music has changed from a solo instrument performance to an ensemble of several folk instruments.

Join Milen Slavov on the accordion and Peter Iliev on

the *tupan* (a two-headed drum) in a repertoire of traditional and contemporary Bulgarian music.

January 16 — Mexican Papel Picado

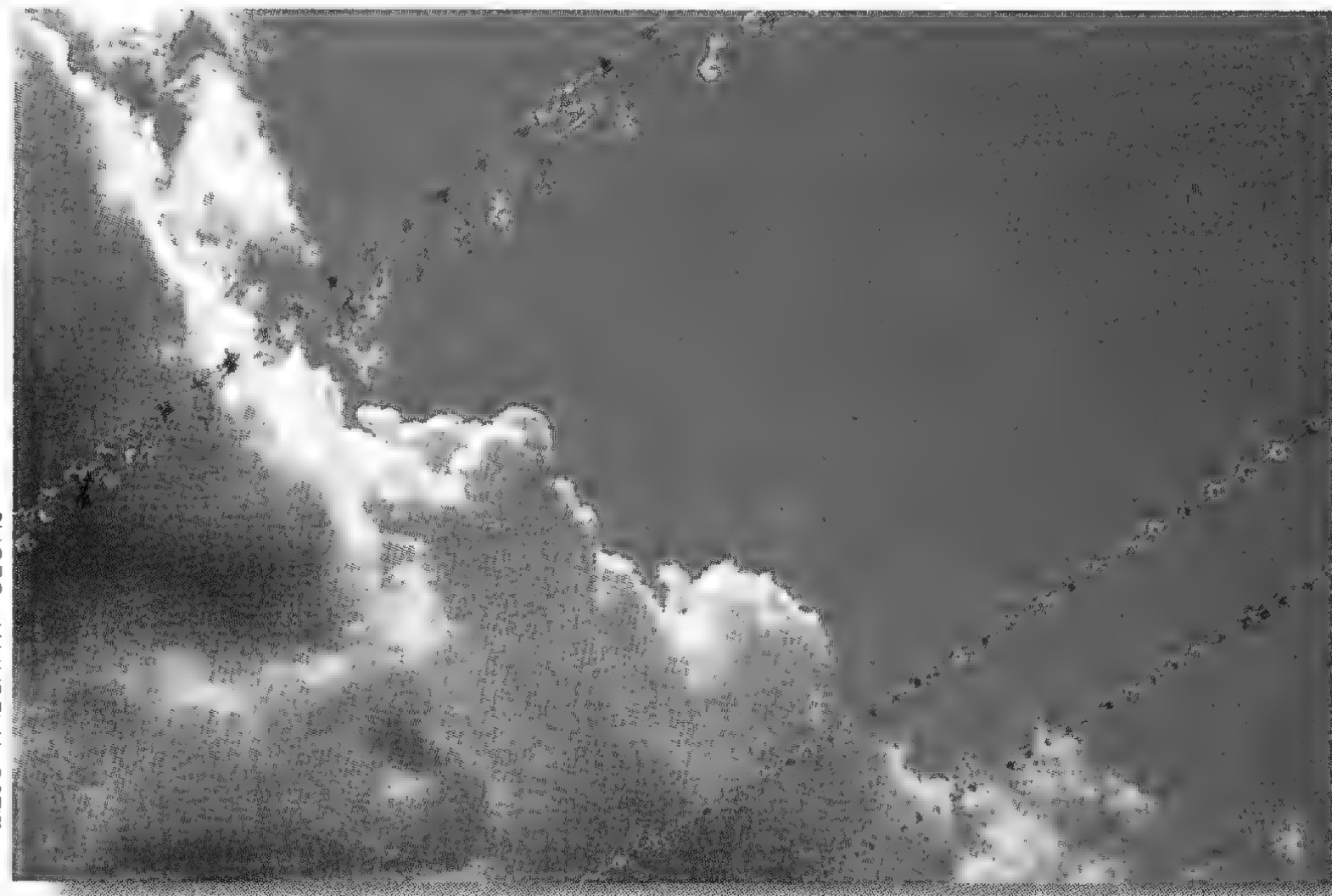


PHOTO: ALMUDENA ORTIZ

Papel picado against the sky.

The art of cutouts has evolved in cultures that have had access to paper, animal skin parchment, knives and scissors. Pre-Columbian Mexicans used bark paper as offerings to their gods and as decoration for temples and palaces. Nowadays Mexican and Chicano cultures use *papel picado* (cut-out-paper decoration) to celebrate traditional holidays such as *El Día de Muertos* and everyday celebrations including birthday, and weddings. Artist Carlos Diaz Todd demonstrates the art of *papel picado*.

January 30 — West Coast Blues

Ron Goldi and his Jack London Band will perform the West Coast Blues — a musical style with roots in Chicago and Texas blues. The five member band plays the harmonica, slide guitar, acoustic guitar, bass and drums.

### Protect your Membership

To help guard against unauthorized use of your membership card, we ask that you show an I.D. when you present your card at the entrance. Please remember that while your guest passes are transferable, your own membership cards are not.

### On Our Cover

A Snowy Egret (*Leucophox thula*) from the Marin-Sonoma coast.

## December – January Sky Show Schedule

### Sky Show                      Weekday Weekend

#### December 1-6, 1998

Stardust                      2 pm                      12 & 2 pm  
ending date: 6/13/99

Journey to the Center of the Universe                      1 & 4 pm  
ending date: 12/6/98

The Sky Tonight                      3 pm

Neighbors in Space                      11 am

#### December 7-10, 1998

Closed for installation.

#### December 11, 1998 - January 10, 1999

No planetarium shows on Christmas Day

The Christmas Star                      2 pm                      12 & 2 pm  
ending date: 1/10/99

Stardust                      1 & 4 pm  
ending date: 6/13/99

The Sky Tonight                      3 pm

Neighbors in Space                      11 am

**Note:** We will offer extra shows from December 28 - 31. Check the Planetarium Box office for schedule.

#### January 11-14, 1999

Closed for installation.

#### January 15-31, 1998

Weekend schedule applies on January 18. Martin Luther King, Jr. Day

1999 Almanac                      2 pm                      12 & 2 pm  
ending date: 3/14/99

Stardust                      1 & 4 pm  
ending date: 6/13/99

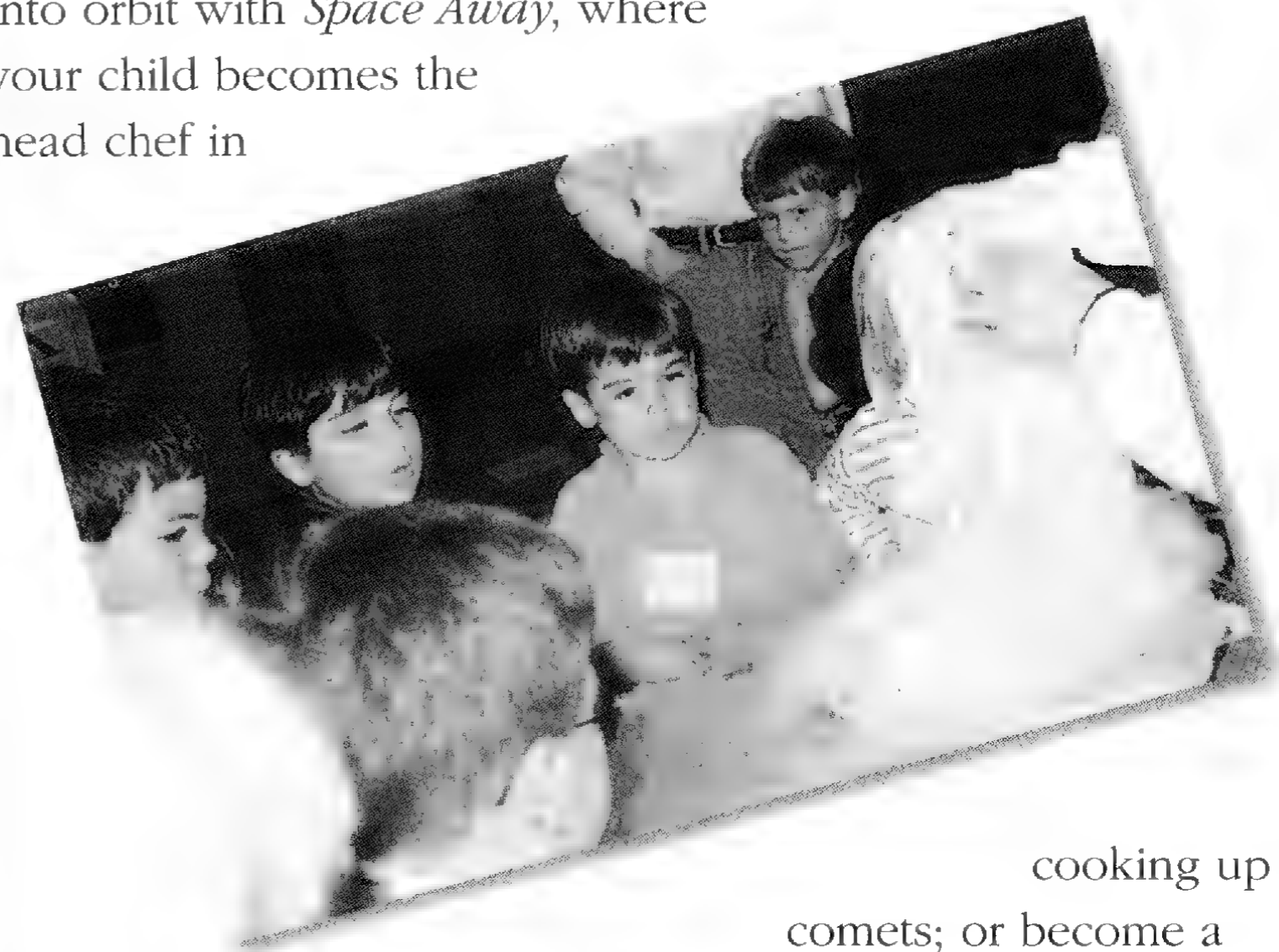
The Sky Tonight                      3 pm

Neighbors in Space                      11 am

Tickets can be purchased one half hour before the show (box office opens at 10:30am on weekends) at the box office once inside the Academy of Sciences (\$2.50 adults, \$1.25 seniors and children (6-17). Members must redeem their passes for tickets at the box office prior to the show. If you have a child under 6 years old with you please ask the cashier for a "Child's Pass." For more information, please call 750-7141.

## Parties for Youths!

Send your kids on a deep sea dive in *Ocean Adventure*, complete with touch tidepool experience; swing into orbit with *Space Away*, where your child becomes the head chef in



cooking up comets; or become a paleontologist by creating fossil replicas in *Dinosaur Encounter*. Select a theme, watch the fun, and sit back and enjoy!

These party packages include admission into the Academy, a reserved area, Academy hosts and hostesses, invitations, party favors, a gift for the party child, tableware, set up, and the dreaded clean up. You supply the cake, drinks and snacks.

Up to twelve children, ages 5 to 10, may enjoy the party for \$215 (Academy members) and \$235 (non-members). There is a maximum of 24 children to a party.

For more information, please call the Group Sales Department at (415) 750-7462.



# An Unforgettable Summer Tale from Camp Academy

**"Predators and Prey Up Close and Personal"  
or "The Beating Heart"**

The Academy's Sonoma County Pepperwood Nature Preserve sprawls over 3,000 acres of Douglas fir forests, oak woodlands, grassland, chaparral, redwood forests, ponds, vernal pools and streams. It's the perfect summer setting for one of Camp Academy's residential outdoor education



Camp Academy at Pepperwood Ranch

programs. Funded in part by BankAmerica Foundation, Camp Academy teaches children about science through first-hand experiences with the natural world.

One group that enjoyed Pepperwood Ranch last summer came from the San Francisco Recreation and Park Department's West Sunset and Presidio Heights Playgrounds. Twelve eager naturalists, aged 10 to 12 years, studied the night skies, collected pond specimens, observed birds and butterflies, and hiked through Pepperwood's forests and grasslands.

During one hike, a red-tailed hawk startled the group by flying up out of the grass in front of them. Camp Academy Leader, Jack Laws, immediately

investigated the area thoroughly and found what the hawk had caught and begun to devour: a California kingsnake. Its head was gone, but the body was still writhing. Instantly recognizing an exciting teaching moment, Jack

quickly gathered the group and dissected the body of the snake. The students were able to see the opened rib cage, the heart (still beating!), and in the gut, the partially digested remains of two moles.

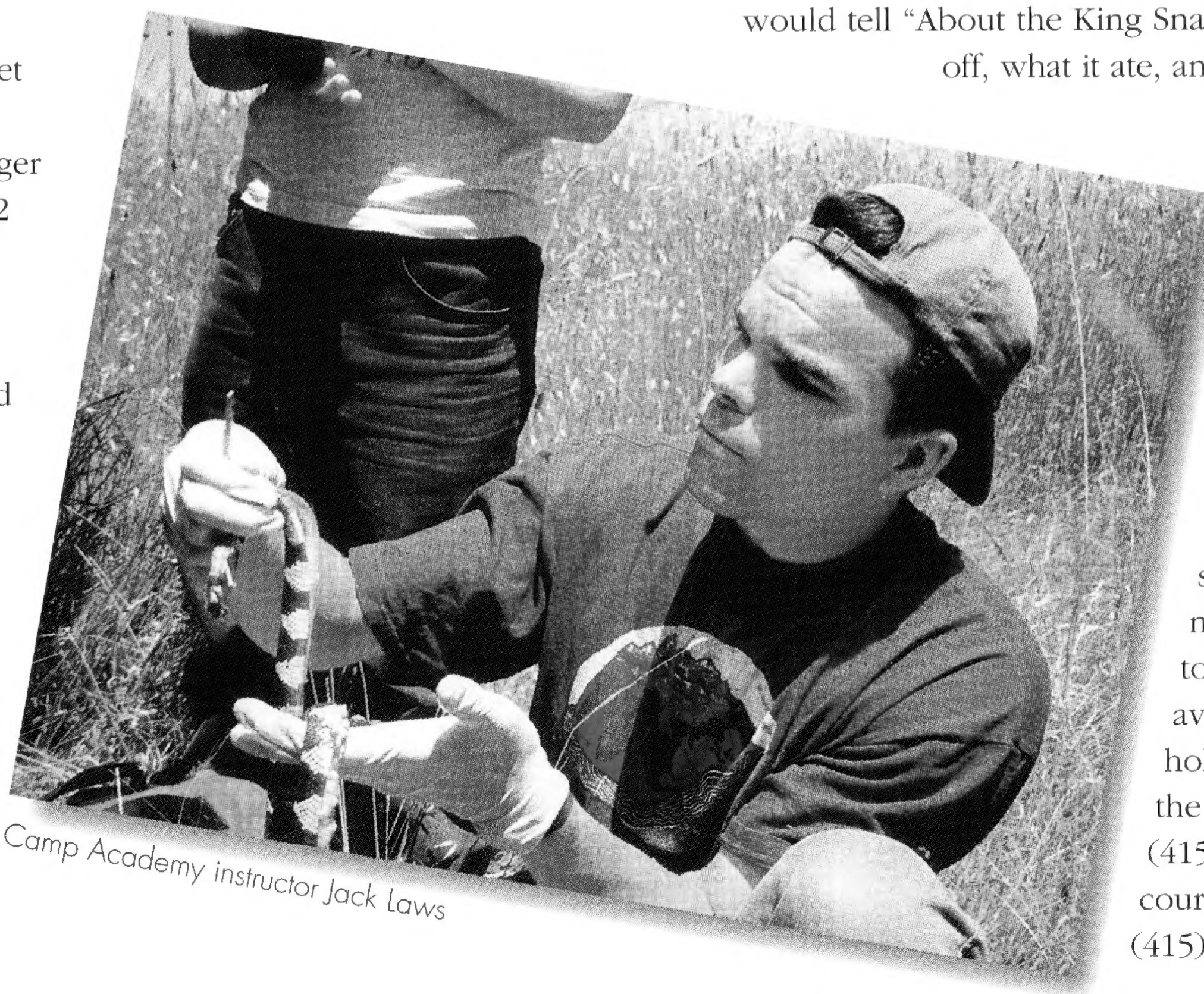
The students were goggle-eyed. Here was hands-on science in the field! One 11 year old, when asked what he would tell a friend about Camp Academy, wrote that he would tell "About the King Snake with its head ripped off, what it ate, and its heart still beating."

Edgar Allen Poe could not have said it better. And what finer way to learn about predator/prey relationships and the food chain than to encounter it in the field?

Look for more summer stories in the next issue. Meanwhile, to check on class availability for winter holiday workshops, call the new hotline: (415) 750-7575. For a course catalog, please call (415) 750-7100.



A young discoverer



Camp Academy instructor Jack Laws

Order Form

**YOUR NAME:** \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Member # \_\_\_\_\_

ADULT EDUCATION	Qty/Members	Qty/Nonmembers	Total
Saving the Marin-Sonoma Coast	___X\$6	___X\$10	=___
Earthquakes and Life along the San Andreas Fault	___X\$6	___X\$10	=___
Skies of Winter (January 8 and 15)	___X\$25	___X\$30	=___
A Gaggle of Geese	___X\$55	___X\$65	=___
Evolution of Flowering Plants (six Wednesdays)	___X\$115	___X\$125	=___

B. DEAN LECTURE SERIES	Quantity	Total
Defining the Early Universe	___X \$3	=___
Observing the Early Universe	___X \$3	=___

**JUNIOR ACADEMY**  
*Please call (415) 750-7100 for class catalog.*

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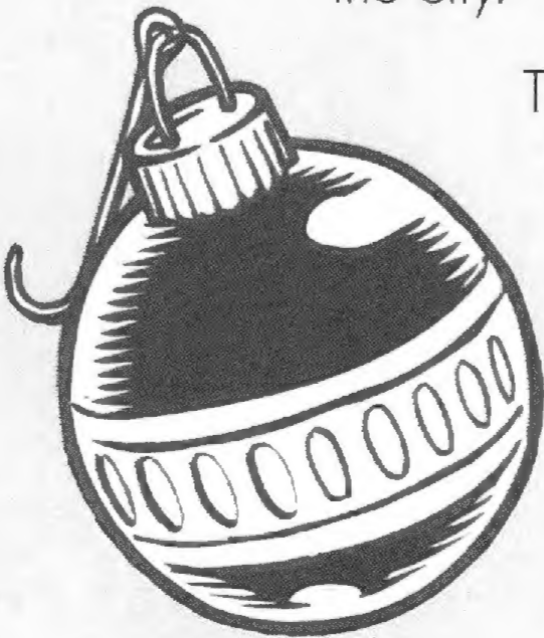
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San Francisco, CA 94118-4495  
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Academy Store

*Tis the Season*

One of the best places to shop for unique holiday gifts is at The Academy Stores. We have six stores to serve you. The Children's Store features natural science gifts for kids. The Ethnic Arts Shop is known for the Hopi, Navajo, and Zuni Indian Jewelry, Raku from Africa, Amber jewelry from the Baltic and Dominican Republic. The Main Gift Store carries a large selection of Adult and Children's books on Natural Science in the city.



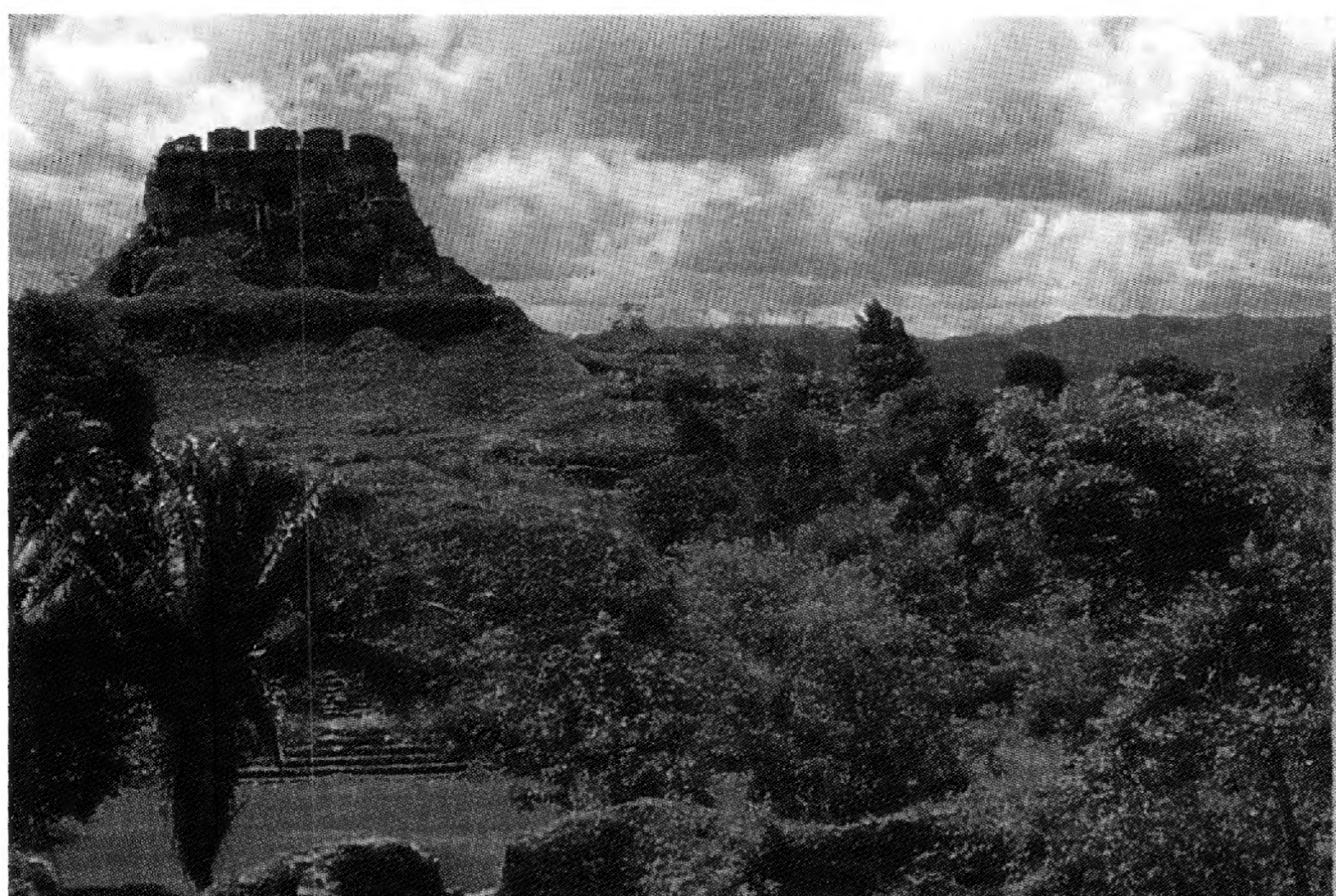
The Microbes Store, The Aftershock Store, and the Swamp Shop all have great exhibit related gifts and books.

Members of the Academy have their very own shopping night on December 9th and will receive 20% off all purchases for the evening.

The Academy Store also offers free gift wrapping.

## Belize: The Ancient Maya and Their Natural World

with Richard Hansen, Wiggie Andrews and Bonnie Frey  
January 31-February 10, 1999



High country passage. Xuantunich, Belize

Unspoiled by tourism, Belize offers a rich landscape of tropical forests, diverse flora and fauna, Maya ruins and pristine marine sanctuaries. This tour to the Maya centers of Belize offers travelers a special opportunity to investigate the rich archaeology and tropical beauty of Belize. With eminent archaeologist Richard Hansen, perennial favorite Wiggie Andrews and Bonnie Frey of the Academy Travel Department you will enjoy an in-depth exploration of the archaeological sites. You will tour the major sites in Belize: Altun Ha, Lamanai, Caracol and Xunantunich. In addition to the intriguing Maya sites, you will be embraced by a forest full of orchids and bromeliads, howler monkeys and brilliant macaws and you will spend a day snorkeling near the world famous Belize Barrier Reef.

*Cost: \$3,890 per person (based on double occupancy) + airfare.*

## Peru (with optional extension to Machu Picchu)

with Doug Bell  
June 9-18, 1999

Journey up the Amazon River by covered longboats to



Machu Picchu

Posada Amazonas, a beautiful lodge nestled in the rainforest built as a joint venture between the native community and Rainforest Expeditions. For a bird's eye view of the forest, canopy climb the observation tower and if you're lucky, you'll see the extremely rare Harpy Eagle. Continue up river to the Tambopata Research Center where you will learn firsthand about the macaw project and regional conservation efforts. At dawn each morning, cross the river to watch as parrots and macaws socialize at the largest known clay lick in South America. Treks through the rainforest reveal a brilliant world of brightly colored macaws, herons, kingfishers and cormorants as well as saddleback tamarinds and spider monkeys frolicking overhead. You will also have two days to explore cosmopolitan Lima.

If 10 days is not enough, extend your South American adventure with an optional journey to Cuzco and Machu Picchu, a mountaintop sanctuary of the Incas that was hidden from the world until 1911.

*Cost: \$4,295 per person (based on double occupancy) including air. Machu Picchu extension \$1,995 per person (based on double occupancy).*

## A Voyage to West Africa

aboard the CLELIA II

with Judy Prokupek

March 29-April 11, 1999

The coast of West Africa captures everyone's imagination with its rich history, colorful markets and exotic sights and sounds. On this distinctive voyage aboard the luxurious CLELIA II, enter a world few travelers have explored as you sail from the Gambia to Portugal. In the Gambia and Senegal you will

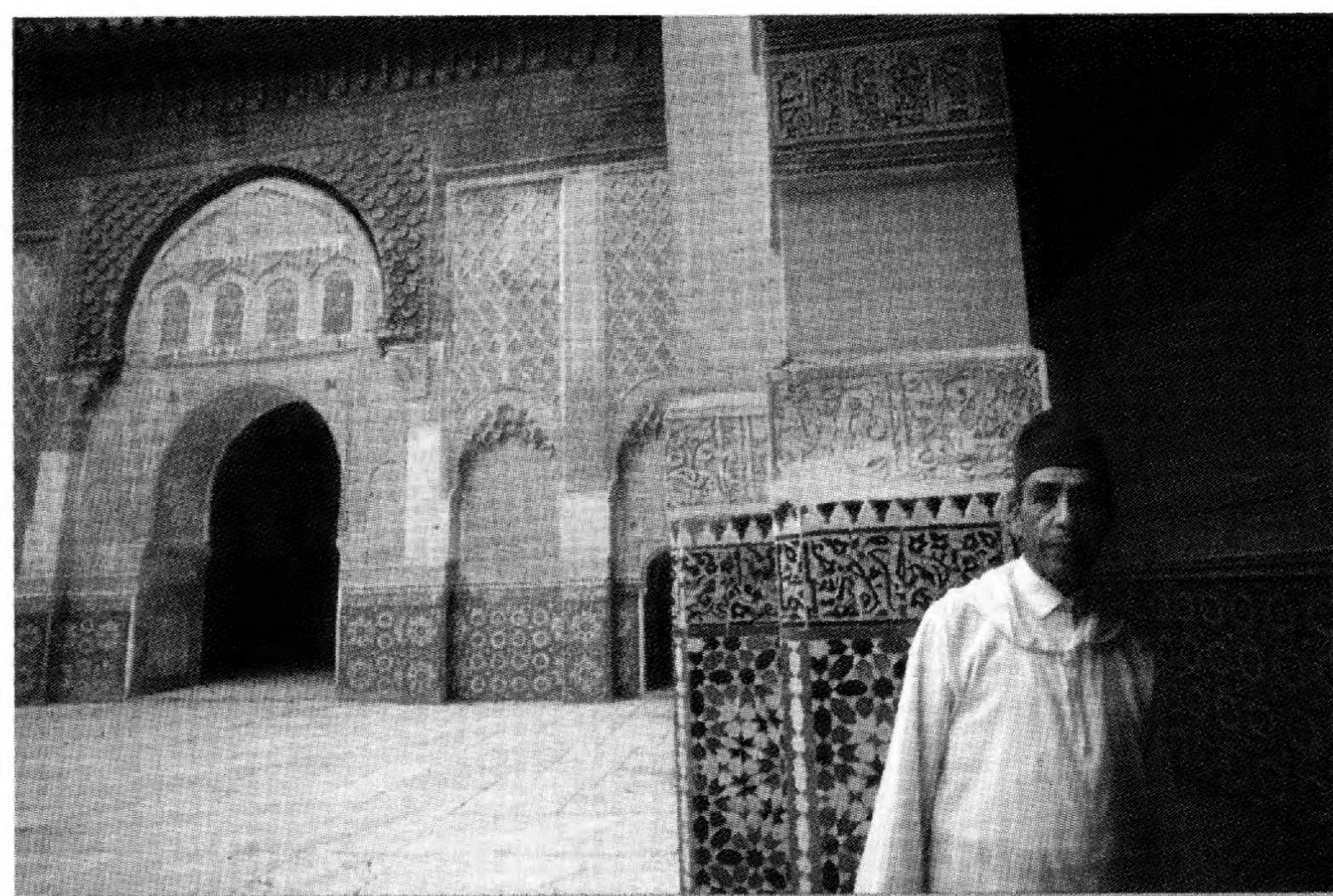


PHOTO: PETER GUTTMAN

Marrakesh

explore rivers and creeks rich in wildlife. While in Mauritania, you travel across the Sahara Desert to a Berber camp. In the Canary Islands, discover the spectacular scenery of the Volcanic Fire Mountains and the spring wildflowers of Las Canadas National Park. This voyage will be shared by U.C. Berkeley Alumni Association and Association of Yale Alumni.

*Cost: From \$7,295 - \$12,995 per person (based on double occupancy) + airfare.*

## December

### 3 Thursday

Saving the Marin-Sonoma Coast  
7 to 8:30 pm  
(Adult Education, p. 8)

### 5 Saturday

Jewish Klezmer Music  
1 pm  
(Traditional Arts, p. 11)

### 9 Wednesday

Members Holiday Evening  
6 to 9 pm  
(no 2 pm meeting)

### 12 Saturday

A Gaggle of Geese, A Wedge of Swans  
7:30 am to 5:30 pm  
(Field trip, p. 9)  
  
Holiday Concert  
1:30 in African Hall  
(Traditional Arts, p. 11)

### 15 Tuesday

Defining the Early Universe  
7:30 pm  
(B. Dean lecture, p. 8)

### 25 Christmas Day

California Academy of Sciences is OPEN  
(No Sky Shows)

## January

### 1 New Year's Day

California Academy of Sciences is OPEN

### 8 Friday

Skies of Winter  
7 to 9:00 pm  
(Adult education, p. 9)

### 9 Saturday

Bulgarian Music  
1 pm  
(Traditional Arts, p. 11)

### 13 Wednesday

Madagascar Odyssey  
2 & 7:30 pm  
(Members Meeting p. 6)

### 14 Thursday

Earthquakes and Life along the San Andreas Fault  
7 to 8:30 pm  
(Adult education, p. 9)

### 15 Friday

Skies of Winter  
7 to 9:00 pm  
(Adult education, p. 9)

### 16 Saturday

Mexican Papel Picado  
1 pm  
(Traditional Arts, p. 11)

### 18 Monday

Martin Luther King Day  
Weekend Sky Show in effect for the Planetarium

### 19 Tuesday

Observing the Early Universe  
7:30 pm  
(B. Dean lecture, p. 8)

### 20 Wednesday

Evolution of Flowering Plants  
7 to 9:00 pm  
(First of six lectures, p. 10)

### 27 Wednesday

Evolution of Flowering Plants  
7 to 9:00 pm  
(Second of six lectures, p. 10)

### 30 Saturday

Evolution of Flowering Plants  
Field trip  
  
West Coast Blues  
1 pm  
(Traditional Arts, p. 11)

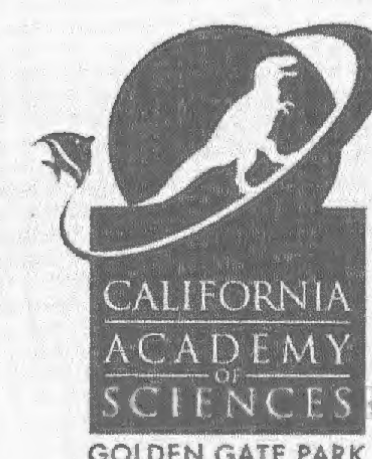
## VISITOR INFORMATION

### Special Exhibitions:

**EARTHQUAKE**  
permanent exhibit  
  
*Pacific Currents*  
through February 28  
  
*The Artist's Universe*  
no ending date  
  
*Microbes*  
through January 10  
  
*Witness*  
ongoing  
  
**Feeding Times:**  
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